



**HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S
FACTUAL REPORT**

Williston, FL

HWY16FH018

(14 pages)

**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C.**

**HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S
FACTUAL REPORT**

A. CRASH INFORMATION

Location: Intersection of eastbound US Highway 27A (US-27A) and NE 140th Court, west of Williston, Florida.
Vehicle1: 2015 Tesla Model S
Operator1: Private vehicle.

Vehicle2: 2014 Freightliner Cascadia truck-tractor in combination with a 53-foot semitrailer
Operator2: Okemah Express, LLC.

Date: Saturday, May 7, 2016
Time: Approximately 4:36 p.m. EST
NTSB #: HWY16FH018

B. HUMAN PERFORMANCE FACTORS GROUP

Ensar Becic, Human Performance Factors Investigator, Group Chairman
NTSB Office of Highway Safety
490 L'Enfant Plaza East, S.W., Washington, DC 20594

C. CRASH SUMMARY

For a summary of the crash, refer to the *Crash Summary Report* in the docket for this investigation.

D. DETAILS OF THE HUMAN PERFORMANCE FACTORS INVESTIGATION

The Human Performance factual investigation focused on the driver of the 2015 Tesla Model S and the driver of the 2014 Freightliner, and the behavioral, medical, operational, and environmental factors that may have influenced or affected the drivers' actions prior to the crash.

1. Tesla Driver

1.1. Background

The Tesla driver was a 40-year-old male. According to the interview with his family—parents and sister—he spent 11 years in the Navy, starting in 1998.¹ During his time in the Navy, he had been deployed overseas, been attached to an explosives unit and had served as a liaison for Navy development. In 2009 he left the Navy and worked as an electrician for two years. In 2011, he started a company—NEXU Innovation—specializing in bringing internet to rural areas. Due to the requirements of his job, he travelled frequently.

At the time of the crash, the Tesla driver held an Ohio Class “D” Driver’s License with motorcycle endorsement and without restrictions. His license was renewed on February 23, 2015 and had an expiration date of January 20, 2019.

An inquiry into Ohio Registrar of Motor Vehicles revealed that Tesla driver had nine traffic violations between July 2010 and September 2015.² Eight of those violations were for speeding, and one for failing to obey traffic signal. The record indicates that the driver has not been involved in a reportable accident, and his license has not been suspended, revoked or denied.

1.2. Activities Prior to the Crash

The investigators utilized the information obtained from the family and witness interviews, Florida Highway Patrol and mobile phone records to reconstruct the driver’s activities prior to the crash.

NTSB investigators interviewed the Tesla driver’s family—parents and sister—nearly three months after the crash. According to that interview, the Tesla driver spent the week prior to the crash—May 1 to May 7—with his family in their motorhome, at Disney Resort in Orlando, Florida. The family reported that the Tesla driver had slept well throughout the vacation and appeared relaxed. The Tesla driver’s family also stated that he left Orlando in the morning of May 7, around 10:00 a.m. The Tesla driver’s sister stated that he had a job scheduled for later that day in Cedar Key, Florida.

The family reported that on the way to Cedar Key, the Tesla driver had stopped at Ocala to charge the Tesla. The Tesla driver’s sister also stated he had sent her a text message following the completion of work at Cedar Key and informed her that he was leaving for the next job site—Swamp Fox, North Carolina. Figure 1 shows the map depicting the locations of Tesla’s driver’s stops and the planned next destination.

¹ Human Performance Attachment 1 – Interview with the Tesla driver’s family.

² Human Performance Attachment 2 – The Tesla driver’s Ohio motor vehicle records.

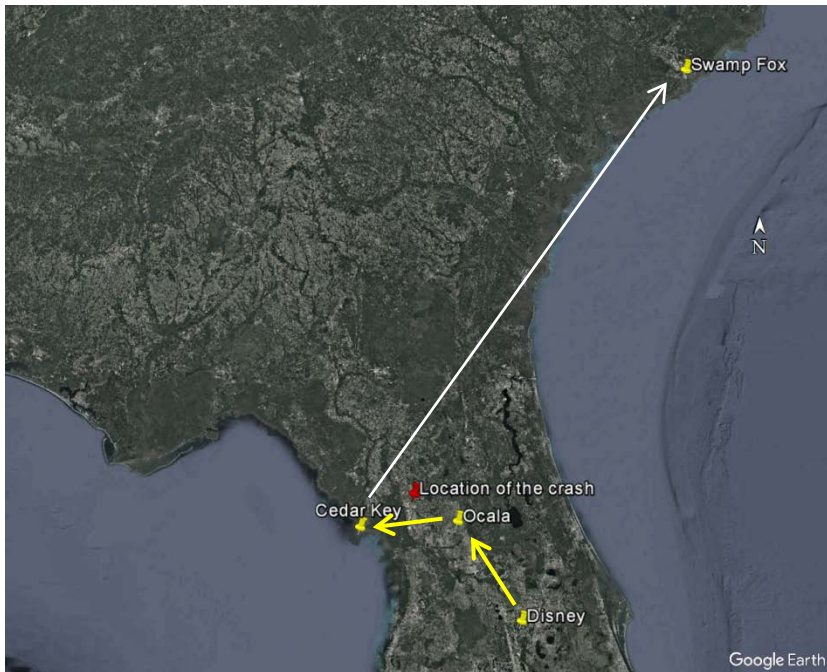


Figure 1. Map depicting Tesla driver’s originating location, the stops and the final destination. Source: Google Earth.

Table 1 depicts the Tesla driver’s activities prior to the crash, based on the phone records,³ and conversations with the driver’s family members.

Sunday - May 1		
Time	Description	Source
Morning ^a	Arrived at Disney World Resort	Family interview
Monday, May 2 – Tuesday, May 3		
Time	Description	Source
All day	Spent time at the resort with family	Family interview
Wednesday, May 4		
Time	Description	Source
All day	Spent time at the resort with family	Family interview
5:59 a.m.	First cell-phone use of the day (texting)	Phone records
6 a.m. – 7 a.m.	16 outgoing and incoming text messages	Phone records
9 a.m. – 10 a.m.	1 text message and one phone conversation	Phone records
10:48 a.m.	Phone conversation	Phone records
4:04 p.m.	Text message	Phone records
6 p.m. – 7 p.m.	2 incoming text messages	Phone records
7 p.m. – 8 p.m.	5 outgoing and incoming text messages	Phone records

³ Human Performance Attachment 3 – The Tesla driver’s phone records.

Thursday, May 5		
<u>Time</u>	<u>Description</u>	<u>Source</u>
Most of the day	Attended a Trade Show	Family interview
5:42 a.m.	First cell-phone use of the day (texting)	Phone records
5:42 a.m. – 6 a.m.	7 outgoing and incoming text messages	Phone records
6 a.m. – 7 a.m.	1 text message and one phone conversation	Phone records
7:24 a.m.	Phone conversation	
8 a.m. – 9 a.m.	5 outgoing and incoming text messages	Phone records
9 a.m. – 10 a.m.	2 phone conversations	
12 p.m. – 1 p.m.	7 outgoing and incoming text messages and 2 phone conversations	Phone records
1 p.m. – 2 p.m.	6 outgoing and incoming text messages and 1 phone conversation	Phone records
3 p.m. – 4 p.m.	4 outgoing and incoming text messages and 3 phone conversations	Phone records
4 p.m. – 5 p.m.	6 outgoing and incoming text messages	Phone records
5 p.m. – 6 p.m.	10 outgoing and incoming text messages	Phone records
6 p.m. – 7 p.m.	2 outgoing and incoming text messages	Phone records
8:03 p.m.	2 text messages	Phone records
Friday, May 6		
<u>Time</u>	<u>Description</u>	<u>Source</u>
4:35 a.m.	First incoming text message of the day	Phone records
6:07 a.m.	1 incoming text message	Phone records
8 a.m. – 9 a.m.	2 incoming text messages	Phone records
9:38 a.m.	1 incoming text message	Phone records
10:03 a.m.	1 incoming text message	Phone records
1:47 p.m.	1 incoming text message	Phone records
4 p.m. – 5 p.m.	3 incoming and outgoing text messages	Phone records
6 p.m. – 7 p.m.	7 incoming and outgoing text messages	Phone records
Saturday, May 7		
<u>Time</u>	<u>Description</u>	<u>Source</u>
5:14 a.m.	First incoming text message of the day	Phone records
5:15 a.m. – 6 a.m.	22 incoming and outgoing text messages	Phone records
6 a.m. – 7 a.m.	2 incoming text messages	Phone records
8 a.m. – 9 a.m.	5 incoming and outgoing text messages	Phone records
9 a.m. – 10 a.m.	11 incoming and outgoing text messages	Phone records
1 p.m. – 2 p.m.	3 incoming and outgoing text messages	Phone records
4:03 p.m.	Sent message to sister informing her that he was leaving for Swamp Fox, NC	Family interview
4:36:12 p.m.	Crash	Vehicle data
^a The Tesla driver arrived sometime in the morning of May 1 st .		

At 4:03 p.m., the Tesla driver's sister received a text message from her brother informing her that he had completed the work at Cedar Key, and was leaving for Swamp Fox, North Carolina, for the next job. This text message did not appear on the Tesla driver's phone records.

NTSB investigators interviewed a witness to the crash who was traveling some distance behind the truck-tractor combination vehicle on US-27A westbound.⁴ The witness reported seeing a passenger vehicle coming eastbound on US-27A, driving a little faster than the speed limit, as the truck-tractor combination vehicle began making the left turn onto 140th NE Court. The witness reported thinking that the driver in the passenger vehicle would need to slow down in order to avoid the potential collision with the combination vehicle. As the witness approached the intersection, he reported hearing the crash and seeing the passenger vehicle emerge from underneath the trailer, continue traveling and departing the roadway. The witness reported observing the driver of the passenger vehicle bobbing up, as the vehicle emerged from underneath the trailer.

1.3. Driver Health

According to the Tesla driver's driver license, he was 5'9" tall and weighed 190 pounds. This equates to a body mass index (BMI) of 29.8.⁵ The driver license did not include any restrictions.

The driver's family stated that he did not drink or smoke and that was in excellent health overall. The driver did not have regular personal physician. The examination of the health insurance records revealed a single hospital visit for the removal of a foreign object in an eye in 2013. According to NTSB medical officers this was minor issue without any long term consequences.

The insurance records did not indicate that the driver was prescribed any medications. NTSB investigators contacted pharmacies in the vicinity of the driver's residence, but did not discover any that had the Tesla driver as their patient.

1.4. Post-Crash Toxicology

During the autopsy of the Tesla driver, the medical examiner at University of Florida Pathology Laboratories, obtained a sample of the driver's blood. University of Florida Pathology Laboratories tested the blood sample for commonly abused illicit drugs; the results were negative.⁶ The NTSB arranged for Civil Aerospace Medical Institute (CAMI) in Oklahoma City, Oklahoma, to conduct additional analysis of that blood sample.⁷ CAMI completed the analysis

⁴ Human Performance Attachment 4 – Witness Interview.

⁵ A body mass index (BMI) number between 25–29.9 is considered “overweight.” See <https://www.cdc.gov/healthyweight/assessing/bmi/> for more information on BMI.

⁶ Human Performance Attachment 5 – Tesla driver's post-crash toxicology screening:UFL.

⁷ Analyses conducted by CAMI could have detected ethanol, amphetamines, opiates, marijuana, cocaine, phencyclidine, benzodiazepines, barbiturates, antidepressants, antihistamines, and commonly used prescription drugs. CAMI provides a comprehensive list on their website: <http://jag.cami.jccbi.gov/toxicology/default.asp?offset=0>.

of the sample on August 26, 2016, and found no evidence of alcohol, illicit drugs, or commonly abused prescription medications in the driver's blood.⁸

1.5. Stress

The Tesla driver was single, has never married and did not have children. According to the Tesla driver's family, he had been relaxed during the vacation in Orlando. The Tesla driver's sister, who helps him with NEXU Innovation, stated that he had been optimistic about the business.

1.6. In-vehicle Distractions

NTSB investigators found the Tesla driver's cell phone, a laptop and several other electronics in the wreckage. However, the investigators did not uncover any evidence that those devices were in use at the time of the crash. The Tesla driver's family provided NTSB investigators with the phone number of his cell phone.

A review of the Tesla driver's phone records indicated that his first outgoing phone activity on May 7, the day of the crash, was at 5:15 a.m. That morning, he sent and received about 40 text messages by 10 a.m., approximate time of his departure from Orlando. The phone records do not indicate phone use—for conversation or short-message-service (SMS) texting—around the time of the crash.

The Tesla driver's phone records indicate that he received and sent text messages between 1 p.m. and 2 p.m., around the time that he was completing the work at Cedar Key. The Tesla driver's sister reported that she received a text message at 4:03 from her brother who informed her that he was completing the work at Cedar Key, and was soon departing for North Carolina. However, this text message does not appear on the phone records. It is unclear if this text message was sent from a text messaging phone application—which would not show on phone records—or another phone.

1.7. Fatigue

Based on the interview with the Tesla driver's family, he had obtained sufficient and restful sleep in the six nights prior to the crash. The phone records indicate that he had an opportunity for eight hours of sleep the night before the crash. Figure 2 illustrates the Tesla driver's rest opportunities in the four days prior to the crash.

⁸ Human Performance Attachment 6 – Tesla driver's post-crash toxicology screening:CAMI.

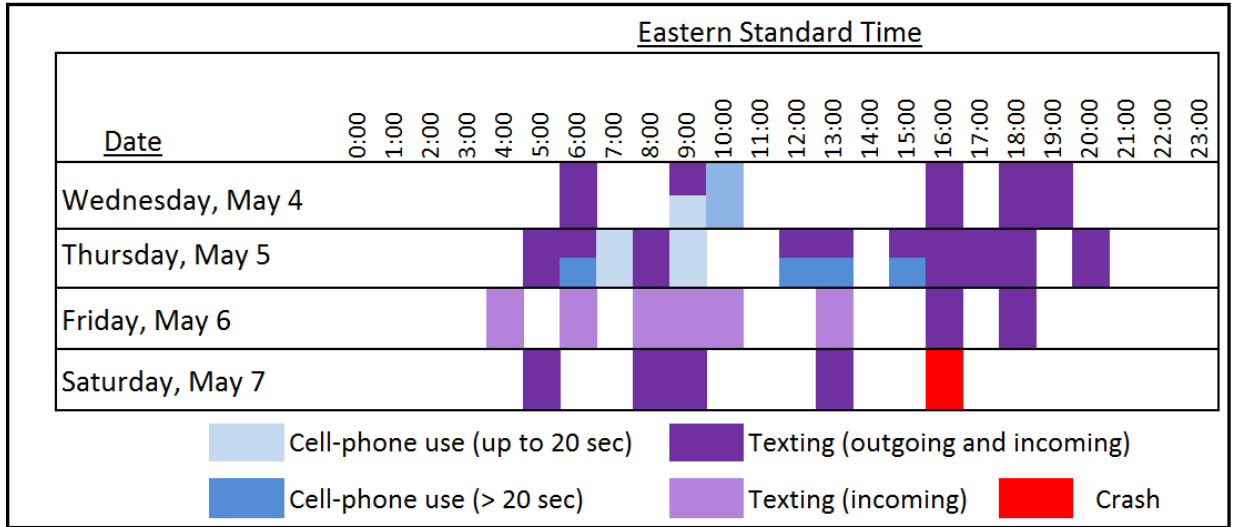


Figure 2. This figure illustrates periods when the driver was conversing and texting on his phone.

2. Truck Driver

2.1. Background

The truck driver was a 62-year-old male. The truck driver refused interview requests by NTSB investigators, but his attorney provided the investigators with some documentation. According to his attorney, for the past six years before the crash, the truck driver had been an owner and sole operator of Okemah Express LLC.

At the time of the crash, the truck driver had a Florida Class “A” commercial driver’s license (CDL) without additional endorsements or restrictions. His license was renewed on November 6, 2012, and had an expiration date of January 13, 2021.

A commercial driver’s license information system (CDLIS) inquiry revealed two traffic violations in 2013—the truck driver failed to obey a traffic control device, and one in 2015—for improper lane change.^{9,10} The CDLIS inquiry also showed that the truck driver had his driving privilege suspended on five occasions between 1984 and 2013 for these reasons:

- Unsatisfied judgement, on April 26, 1984.
- Speeding, on October 21, 1991.
- Speeding, on December 20, 1991.
- Failure to appear for trial/court, on April 6, 2005.
- Failure to surrender license for a commercial conviction, on October 28, 2013.

⁹ The Commercial Driver’s License Information System (CDLIS) is a nationwide computer system that enables state driver licensing agencies (SDLAs) to ensure that each commercial driver has only one driver’s license and one complete driver record. State driver licensing agencies use CDLIS to complete various procedures, including: (1) transmitting out-of-state convictions and withdrawals; (2) transferring the driver record when a commercial driver’s license holder moves to another state; and (3) responding to requests for driver status and history.

¹⁰ Human Performance Attachment 7 – Truck driver’s motor vehicle records.

Other than the 2013 suspension that affected only his commercial driving privilege, the other suspensions affected—if applicable at the time—both commercial and private vehicle driving privileges.

NTSB subpoenaed the driver and requested the following documents:

- Driver’s logbooks for the six-month period ending on May 7, 2016
- All maintenance, service and inspection records for the truck-tractor and the trailer
- Driver’s medical long form and driver qualification file
- Drug and alcohol testing results, including the name of consortium, random test results, and post-crash test results
- All freight bills or bills of landing for the 12 months prior to May 7, 2016
- Names of driver’s primary care physician and health care provider
- Copy of driver’s CDL; driver’s working history for the past six years
- Fuel and food receipts between May 4, 2017 and May 8, 2016.

Information from the documents that the NTBS received is presented in this report. Any subpoenaed information that was missing or incomplete is also acknowledged.

2.2. Activities Prior to the Crash

The investigators utilized the information obtained through the subpoena and mobile phone records to reconstruct the truck driver’s activities prior to the crash.¹¹ Table 2 presents the information obtained from those sources.

Wednesday, May 4		
<u>Time</u>	<u>Description</u>	<u>Source</u>
10:07 a.m.	First cell-phone use of the day (inbound)	Phone records
11:18 a.m.	1 phone conversation (inbound)	Phone records
1:15 p.m.	1 text message	Phone records
8 p.m. – 9 p.m.	2 phone conversations (outbound)	Phone records
Thursday, May 5		
<u>Time</u>	<u>Description</u>	<u>Source</u>
10:25 a.m.	First cell-phone use of the day (outbound conversation)	Phone records
10:56 a.m.	1 outbound phone conversation	Phone records
12:04 p.m.	1 inbound phone conversation	Phone records
1 p.m. – 2 p.m.	3 phone conversations	Phone records
2 p.m. – 3 p.m.	2 phone conversations	Phone records
3 p.m. – 4 p.m.	3 phone conversations	Phone records

¹¹ Human Performance Attachment 8 – Truck driver’s phone records.

Friday, May 6		
<u>Time</u>	<u>Description</u>	<u>Source</u>
10:18 a.m.	First cell-phone use of the day (inbound conversation)	Phone records
11:43 a.m.	1 inbound phone conversation	Phone records
1 p.m. – 2 p.m.	3 phone conversations	Phone records
2 p.m. – 3 p.m.	3 phone conversations	Phone records
5:17 p.m.	1 inbound phone conversation	Phone records
7 p.m. – 8 p.m.	6 phone conversations and 1 text message	Phone records
9:36 p.m.	1 inbound phone conversation	Phone records
10 p.m. – 11 p.m.	3 phone conversations	Phone records
11 p.m. – 12 a.m.	2 phone conversations	Phone records
Saturday, May 7		
<u>Time</u>	<u>Description</u>	<u>Source</u>
12 a.m. – 8 a.m.	In sleeper berth	Log records
7:06 a.m.	First cell-phone use of the day (outbound conversation)	Phone records
7:58 a.m.	1 inbound phone conversation	Phone records
8 a.m. – 9 a.m.	5 outbound phone conversations	Phone records
8 a.m. – 9:30 a.m.	Driving	Log records
9 a.m. – 9:30 a.m.	2 outbound phone conversations and 1 inbound text message	Phone records
9:30 a.m. – 10 a.m.	2 outbound phone conversations	Phone records
10 a.m. – 1 p.m.	Off duty	Log records
10 a.m. – 11 a.m.	2 outbound phone conversations	Phone records
11 a.m. – 12 p.m.	8 phone conversations and 2 text messages	Phone records
12 p.m. – 1 p.m.	2 outbound phone conversations	Phone records
1 p.m. – 4:36 p.m. (crash)	Driving	Log records
1 p.m. – 2 p.m.	2 outbound phone conversations and 1 inbound text message	Phone records
2 p.m. – 3 p.m.	4 phone conversations	Phone records
4 p.m. – 4:11 p.m.	2 inbound phone conversations	Phone records
4:36:12 p.m.	Crash	Vehicle data

* The orange shaded cells indicate cell-phone use while on-duty driving.

2.1. Driver Health

The truck driver's medical certificate was valid for two years, until September 28, 2017. According to the September 18, 2015 medical examination for recertification for commercial driver fitness, did not report suffering from any medical conditions. The truck driver was noted as having blood pressure of 138/88 (just below the certification threshold of 140/90), and his urine sample was normal—absent of sugar or protein. The September 2015 medical certification

report indicated that the truck driver was 5'8" tall and weighed 246 pounds.¹² This equates to BMI of 37.4.¹³ The truck driver's hearing met minimum regulatory standards. Based on the Snellen test, his uncorrected binocular acuity was 20/25. The uncorrected acuity in his right eye was 20/25, and 20/25 in his left eye.

The practitioner performing the medical recertification noted that the driver did not need a sleep study, as only one risk factor was present. The NTSB investigators presume this risk factor to be BMI.

NTSB investigators contacted pharmacies in the vicinity of the driver's residence, but did not uncover any that had the driver as their patient.

2.2. Post-Crash Toxicology

Following the crash, at the direction of FHP, a blood sample from the truck driver was obtained at 6:11 p.m., about 1.5 hours after the crash. The sample was sent to the Florida Department of Law Enforcement laboratory for toxicological analysis.¹⁴ The sample tested was positive for THC and its metabolite, and negative for 9 common classes of abuse drugs.¹⁵

At the request of the NTSB, CAMI conducted additional analysis of the limited amount of the truck driver's blood sample.¹⁶ This analysis was completed on May 17, 2017, and revealed:¹⁷

- 3.1 nanograms/milliliter (ng/mL) of Tetrahydrocannabinol (THC)
- 66.2 ng/mL of THC metabolite, tetrahydrocannabinol carboxylic acid.

The Department of Transportation (DOT) post-crash drug and alcohol testing was not performed. DOT regulations require a carrier to submit the accident driver for drug and alcohol screening following a crash. The carrier did not comply with this regulation.

2.3. Stress

Due to his refusal to talk to NTSB investigators, it is not known at this time whether the driver suffered from stresses due to his job or personal life.

¹² The FHP crash report indicates that the driver was 5'10" tall and weighed 245 pounds, corresponding to BMI of 35.2, which would still be "obese".

¹³ A body mass index (BMI) number above 29 is considered "obese." See <https://www.cdc.gov/healthyweight/assessing/bmi/> for more information on BMI.

¹⁴ Human Performance Attachment 9 – Truck driver's post-crash toxicology screening: FDLE.

¹⁵ The Florida Department of Law Enforcement laboratory tested for the following: amphetamines, barbiturates, benzodiazepines, cannabinoids, carisoprodol, cocaine, methadone, methamphetamine, opiates, and oxycodone. The analysis for positive for THC and 11-Nor-9-carboxy-THC—the THC metabolite.

¹⁶ Analyses conducted by CAMI detect amphetamines, opiates, marihuana, cocaine, phencyclidine, benzodiazepines, barbiturates, antidepressants, antihistamines.

¹⁷ Human Performance Attachment 10 – Truck driver's post-crash toxicology screening: CAMI.

2.4. In-vehicle Distractions

NTSB investigators subpoenaed the truck driver’s personal phone records. The review of those records revealed that on the day of the crash, the truck driver had 15 phone conversations while driving, the last one occurring at 4:11 p.m. The phone records do not indicate phone use—for conversation or short-message-service (SMS) texting—around the time of the crash.

2.5. Fatigue

Florida Highway Patrol’s report indicates zero on-duty hours between May 1 and May 6, although the truck driver’s log reports are missing for that period.¹⁸ The vehicle factual report for this crash indicates that the tractor’s electronic control module recorded no activity for May 1, May 4 and May 5, and minimal activity for May 2 and May 3. The driver’s log entry for May 7 indicates that he was in sleeper berth from 12 a.m. until 8 a.m. at which point he was on-duty and driving.

Based on the driver’s phone records, his last phone activity the night before the crash ended at 11:25 p.m. The first phone activity on the day of the crash occurred at 7:06 a.m., indicating that the driver had about 7.5 hours of uninterrupted sleep opportunity the night before the crash.

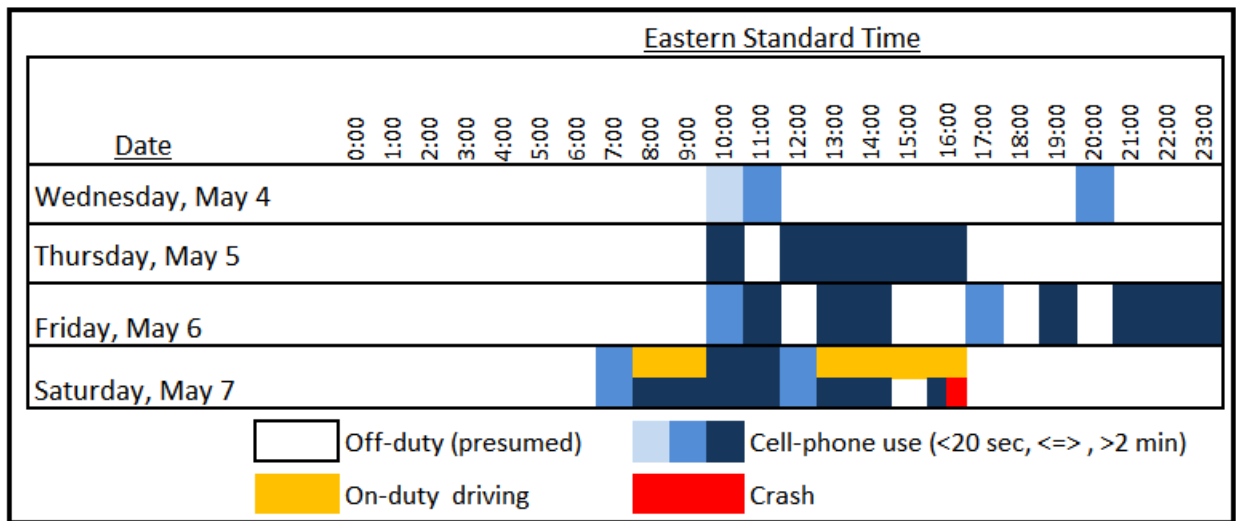


Figure 3. This figure illustrates periods when the driver was on-duty and when he used his cellular phone.

3. Weather

The closest official National Weather Service weather observations to the accident site were from Ocala Regional-Taylor Airport (KOCF), Ocala, located approximately 28 miles

¹⁸ Human Performance Attachment 11 – FHP post-crash motor carrier inspection report.

southeast of the crash site. Data for observations closest to the time of the crash is shown in Table 3.¹⁹

3.1. Illumination

According to the United States Naval Observatory, for May 7, civil twilight began at 6:17 a.m., sunrise occurred at 6:43 a.m., sunset occurred at 8:10 p.m., and civil twilight ended at 8:36 p.m.

Table 3. Weather Data from KOCF.

Time (PDT)	6:42 a.m.
Temperature	64° F
Dew Point	47° F
Humidity	63%
Pressure	29.98 in
Wind Dir.	WNW
Wind Speed	3 mph
Max Wind Gust Speed	21 mph
Precipitation	0.00
Visibility	10 miles
Events	N/A
Conditions	N/A

E. DOCKET MATERIAL

The following attachments are included in the docket for this investigation:

LIST OF ATTACHMENTS

Human Performance Attachment 1 - Interview with the Tesla driver's family

Human Performance Attachment 2 - Tesla driver's Ohio motor vehicle records

Human Performance Attachment 3 - Tesla driver's phone records

Human Performance Attachment 4 - Witness interview

Human Performance Attachment 5 - Tesla driver's toxicology screening: UFL

Human Performance Attachment 6 - Tesla driver's toxicology screening: CAMI

Human Performance Attachment 7 - Truck driver's motor vehicle records

¹⁹ Historical data obtained from Weather Underground. See more information at <https://www.wunderground.com/>.

Human Performance Attachment 8 - Truck driver's phone records

Human Performance Attachment 9 - Truck driver's toxicology screening: FDLE

Human Performance Attachment 10 - Truck driver's toxicology screening: CAMI

Human Performance Attachment 11 - FHP post-crash motor carrier inspection report

(Ensar Becic, Ph.D.)

(Senior Human Performance Investigator)